SEQUENCE LISTING

<110> Sprecher, Eli
        Bergman, Reuven

<120> METHODS OF AND COMPOSITIONS FOR MODULATING HAIR GROWTH VIA P-CADHERIN MODULATORS

<130> 26465

<160> 75

<170> PatentIn version 3.1

<210> 1

<211> 790

<212> PRT

<213> Homo sapiens

<400> 1

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Met Arg Thr Tyr Arg Tyr Phe Leu Leu Leu Phe Trp Val Gly Gln Pro
1               5                   10                  15

Tyr Pro Thr Leu Ser Thr Pro Leu Ser Lys Arg Thr Ser Gly Phe Pro
            20                  25                  30

Ala Lys Lys Arg Ala Leu Glu Leu Ser Gly Asn Ser Lys Asn Glu Leu
        35                  40                  45

Asn Arg Ser Lys Arg Ser Trp Met Trp Asn Gln Phe Phe Leu Leu Glu
    50                  55                  60

Glu Tyr Thr Gly Ser Asp Tyr Gln Tyr Val Gly Lys Leu His Ser Asp
65                  70                  75                  80

Gln Asp Arg Gly Asp Gly Ser Leu Lys Tyr Ile Leu Ser Gly Asp Gly
                85                  90                  95

Ala Gly Asp Leu Phe Ile Ile Asn Glu Asn Thr Gly Asp Ile Gln Ala
            100                 105                 110

Thr Lys Arg Leu Asp Arg Glu Glu Lys Pro Val Tyr Ile Leu Arg Ala
        115                 120                 125
```

```
Gln Ala Ile Asn Arg Arg Thr Gly Arg Pro Val Glu Pro Glu Ser Glu
    130                 135                 140

Phe Ile Ile Lys Ile His Asp Ile Asn Asp Asn Glu Pro Ile Phe Thr
145                 150                 155                 160

Lys Glu Val Tyr Thr Ala Thr Val Pro Glu Met Ser Asp Val Gly Thr
                165                 170                 175

Phe Val Val Gln Val Thr Ala Thr Asp Ala Asp Asp Pro Thr Tyr Gly
            180                 185                 190

Asn Ser Ala Lys Val Val Tyr Ser Ile Leu Gln Gly Gln Pro Tyr Phe
        195                 200                 205

Ser Val Glu Ser Glu Thr Gly Ile Ile Lys Thr Ala Leu Leu Asn Met
    210                 215                 220

Asp Arg Glu Asn Arg Glu Gln Tyr Gln Val Val Ile Gln Ala Lys Asp
225                 230                 235                 240

Met Gly Gly Gln Met Gly Gly Leu Ser Gly Thr Thr Thr Val Asn Ile
                245                 250                 255

Thr Leu Thr Asp Val Asn Asp Asn Pro Pro Arg Phe Pro Gln Ser Thr
            260                 265                 270

Tyr Gln Phe Lys Thr Pro Glu Ser Ser Pro Pro Gly Thr Pro Ile Gly
        275                 280                 285

Arg Ile Lys Ala Ser Asp Ala Asp Val Gly Glu Asn Ala Glu Ile Glu
    290                 295                 300

Tyr Ser Ile Thr Asp Gly Glu Gly Leu Asp Met Phe Asp Val Ile Thr
305                 310                 315                 320

Asp Gln Glu Thr Gln Glu Gly Ile Ile Thr Val Lys Lys Leu Leu Asp
                325                 330                 335

Phe Glu Lys Lys Lys Val Tyr Thr Leu Lys Val Glu Ala Ser Asn Pro
            340                 345                 350

Tyr Val Glu Pro Arg Phe Leu Tyr Leu Gly Pro Phe Lys Asp Ser Ala
        355                 360                 365

Thr Val Arg Ile Val Val Glu Asp Val Asp Glu Pro Pro Val Phe Ser
    370                 375                 380

Lys Leu Ala Tyr Ile Leu Gln Ile Arg Glu Asp Ala Gln Ile Asn Thr
```

```
385                 390                 395                 400

Thr Ile Gly Ser Val Thr Ala Gln Asp Pro Asp Ala Ala Arg Asn Pro
                405                 410                 415

Val Lys Tyr Ser Val Asp Arg His Thr Asp Met Asp Arg Ile Phe Asn
            420                 425                 430

Ile Asp Ser Gly Asn Gly Ser Ile Phe Thr Ser Lys Leu Leu Asp Arg
        435                 440                 445

Glu Thr Leu Leu Trp His Asn Ile Thr Val Ile Ala Thr Glu Ile Asn
    450                 455                 460

Asn Pro Lys Gln Ser Ser Arg Val Pro Leu Tyr Ile Lys Val Leu Asp
465                 470                 475                 480

Val Asn Asp Asn Ala Pro Glu Phe Ala Glu Phe Tyr Glu Thr Phe Val
                485                 490                 495

Cys Glu Lys Ala Lys Ala Asp Gln Leu Ile Gln Thr Leu His Ala Val
            500                 505                 510

Asp Lys Asp Asp Pro Tyr Ser Gly His Gln Phe Ser Phe Ser Leu Ala
        515                 520                 525

Pro Glu Ala Ala Ser Gly Ser Asn Phe Thr Ile Gln Asp Asn Lys Asp
    530                 535                 540

Asn Thr Ala Gly Ile Leu Thr Arg Lys Asn Gly Tyr Asn Arg His Glu
545                 550                 555                 560

Met Ser Thr Tyr Leu Leu Pro Val Val Ile Ser Asp Asn Asp Tyr Pro
                565                 570                 575

Val Gln Ser Ser Thr Gly Thr Val Thr Val Arg Val Cys Ala Cys Asp
            580                 585                 590

His His Gly Asn Met Gln Ser Cys His Ala Glu Ala Leu Ile His Pro
        595                 600                 605

Thr Gly Leu Ser Thr Gly Ala Leu Val Ala Ile Leu Leu Cys Ile Val
    610                 615                 620

Ile Leu Leu Val Thr Val Val Leu Phe Ala Ala Leu Arg Arg Gln Arg
625                 630                 635                 640

Lys Lys Glu Pro Leu Ile Ile Ser Lys Glu Asp Ile Arg Asp Asn Ile
                645                 650                 655
```

```
Val Ser Tyr Asn Asp Glu Gly Gly Gly Glu Glu Asp Thr Gln Ala Phe
            660                 665                 670

Asp Ile Gly Thr Leu Arg Asn Pro Glu Ala Ile Glu Asp Asn Lys Leu
        675                 680                 685

Arg Arg Asp Ile Val Pro Glu Ala Leu Phe Leu Pro Arg Arg Thr Pro
    690                 695                 700

Thr Ala Arg Asp Asn Thr Asp Val Arg Asp Phe Ile Asn Gln Arg Leu
705                 710                 715                 720

Lys Glu Asn Asp Thr Asp Pro Thr Ala Pro Pro Tyr Asp Ser Leu Ala
                725                 730                 735

Thr Tyr Ala Tyr Glu Gly Thr Gly Ser Val Ala Asp Ser Leu Ser Ser
            740                 745                 750

Leu Glu Ser Val Thr Thr Asp Ala Asp Gln Asp Tyr Asp Tyr Leu Ser
        755                 760                 765

Asp Trp Gly Pro Arg Phe Lys Lys Leu Ala Asp Met Tyr Gly Gly Val
    770                 775                 780

Asp Ser Asp Lys Asp Ser
785                 790

<210>  2

<211>  794

<212>  PRT

<213>  Homo sapiens


<400>  2

Met Leu Thr Arg Asn Cys Leu Ser Leu Leu Leu Trp Val Leu Phe Asp
1               5                   10                  15

Gly Gly Leu Leu Thr Pro Leu Gln Pro Gln Pro Gln Gln Thr Leu Ala
            20                  25                  30

Thr Glu Pro Arg Glu Asn Val Ile His Leu Pro Gly Gln Arg Ser His
        35                  40                  45

Phe Gln Arg Val Lys Arg Gly Trp Val Trp Asn Gln Phe Phe Val Leu
    50                  55                  60

Glu Glu Tyr Val Gly Ser Glu Pro Gln Tyr Val Gly Lys Leu His Ser
65                  70                  75                  80
```

```
Asp Leu Asp Lys Gly Glu Gly Thr Val Lys Tyr Thr Leu Ser Gly Asp
                85                  90                  95

Gly Ala Gly Thr Val Phe Thr Ile Asp Glu Thr Thr Gly Asp Ile His
            100                 105                 110

Ala Ile Arg Ser Leu Asp Arg Glu Glu Lys Pro Phe Tyr Thr Leu Arg
        115                 120                 125

Ala Gln Ala Val Asp Ile Glu Thr Arg Lys Pro Leu Glu Pro Glu Ser
    130                 135                 140

Glu Phe Ile Ile Lys Val Gln Asp Ile Asn Asp Asn Glu Pro Lys Phe
145                 150                 155                 160

Leu Asp Gly Pro Tyr Val Ala Thr Val Pro Glu Met Ser Pro Val Gly
                165                 170                 175

Ala Tyr Val Leu Gln Val Lys Ala Thr Asp Ala Asp Asp Pro Thr Tyr
            180                 185                 190

Gly Asn Ser Ala Arg Val Val Tyr Ser Ile Leu Gln Gly Gln Pro Tyr
        195                 200                 205

Phe Ser Ile Asp Pro Lys Thr Gly Val Ile Arg Thr Ala Leu Pro Asn
    210                 215                 220

Met Asp Arg Glu Val Lys Glu Gln Tyr Gln Val Leu Ile Gln Ala Lys
225                 230                 235                 240

Asp Met Gly Gly Gln Leu Gly Gly Leu Ala Gly Thr Thr Ile Val Asn
                245                 250                 255

Ile Thr Leu Thr Asp Val Asn Asp Asn Pro Pro Arg Phe Pro Lys Ser
            260                 265                 270

Ile Phe His Leu Lys Val Pro Glu Ser Ser Pro Ile Gly Ser Ala Ile
        275                 280                 285

Gly Arg Ile Arg Ala Val Asp Pro Asp Phe Gly Gln Asn Ala Glu Ile
    290                 295                 300

Glu Tyr Asn Ile Val Pro Gly Asp Gly Gly Asn Leu Phe Asp Ile Val
305                 310                 315                 320

Thr Asp Glu Asp Thr Gln Glu Gly Val Ile Lys Leu Lys Lys Pro Leu
                325                 330                 335

Asp Phe Glu Thr Lys Lys Ala Tyr Thr Phe Lys Val Glu Ala Ser Asn
            340                 345                 350
```

```
Leu His Leu Asp His Arg Phe His Ser Ala Gly Pro Phe Lys Asp Thr
        355                 360                 365

Ala Thr Val Lys Ile Ser Val Leu Asp Val Asp Glu Pro Pro Val Phe
    370                 375                 380

Ser Lys Pro Leu Tyr Thr Met Glu Val Tyr Glu Asp Thr Pro Val Gly
385                 390                 395                 400

Thr Ile Ile Gly Ala Val Thr Ala Gln Asp Leu Asp Val Gly Ser Gly
                405                 410                 415

Ala Val Arg Tyr Phe Ile Asp Trp Lys Ser Asp Gly Asp Ser Tyr Phe
            420                 425                 430

Thr Ile Asp Gly Asn Glu Gly Thr Ile Ala Thr Asn Glu Leu Leu Asp
        435                 440                 445

Arg Glu Ser Thr Ala Gln Tyr Asn Phe Ser Ile Ile Ala Ser Lys Val
    450                 455                 460

Ser Asn Pro Leu Leu Thr Ser Lys Val Asn Ile Leu Ile Asn Val Leu
465                 470                 475                 480

Asp Val Asn Glu Phe Pro Pro Glu Ile Ser Val Pro Tyr Glu Thr Ala
                485                 490                 495

Val Cys Glu Asn Ala Lys Pro Gly Gln Ile Ile Gln Ile Val Ser Ala
            500                 505                 510

Ala Asp Arg Asp Leu Ser Pro Ala Gly Gln Gln Phe Ser Phe Arg Leu
        515                 520                 525

Ser Pro Glu Ala Ala Ile Lys Pro Asn Phe Thr Val Arg Asp Phe Arg
    530                 535                 540

Asn Asn Thr Ala Gly Ile Glu Thr Arg Arg Asn Gly Tyr Ser Arg Arg
545                 550                 555                 560

Gln Gln Glu Leu Tyr Phe Leu Pro Val Val Ile Glu Asp Ser Ser Tyr
                565                 570                 575

Pro Val Gln Ser Ser Thr Asn Thr Met Thr Ile Arg Val Cys Arg Cys
            580                 585                 590

Asp Ser Asp Gly Thr Ile Leu Ser Cys Asn Val Glu Ala Ile Phe Leu
        595                 600                 605

Pro Val Gly Leu Ser Thr Gly Ala Leu Ile Ala Ile Leu Leu Cys Ile
```

```
    610                 615                 620

Val Ile Leu Leu Ala Ile Val Val Leu Tyr Val Ala Leu Arg Arg Gln
625                 630                 635                 640

Lys Lys Lys His Thr Leu Met Thr Ser Lys Glu Asp Ile Arg Asp Asn
                645                 650                 655

Val Ile His Tyr Asp Asp Glu Gly Gly Gly Glu Glu Asp Thr Gln Ala
            660                 665                 670

Phe Asp Ile Gly Ala Leu Arg Asn Pro Lys Val Ile Glu Glu Asn Lys
        675                 680                 685

Ile Arg Arg Asp Ile Lys Pro Asp Ser Leu Cys Leu Pro Arg Gln Arg
    690                 695                 700

Pro Pro Met Glu Asp Asn Thr Asp Ile Arg Asp Phe Ile His Gln Arg
705                 710                 715                 720

Leu Gln Glu Asn Asp Val Asp Pro Thr Ala Pro Pro Ile Asp Ser Leu
                725                 730                 735

Ala Thr Tyr Ala Tyr Glu Gly Ser Gly Ser Val Ala Glu Ser Leu Ser
            740                 745                 750

Ser Ile Asp Ser Leu Thr Thr Glu Ala Asp Gln Asp Tyr Asp Tyr Leu
        755                 760                 765

Thr Asp Trp Gly Pro Arg Phe Lys Val Leu Ala Asp Met Phe Gly Glu
    770                 775                 780

Glu Glu Ser Tyr Asn Pro Asp Lys Val Thr
785                 790
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<210> 3

<211> 799

<212> PRT

<213> Homo sapiens

<400> 3

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Met Pro Glu Arg Leu Ala Glu Met Leu Leu Asp Leu Trp Thr Pro Leu
1               5                   10                  15

Ile Ile Leu Trp Ile Thr Leu Pro Pro Cys Ile Tyr Met Ala Pro Met
            20                  25                  30
```

```
Asn Gln Ser Gln Val Leu Met Ser Gly Ser Pro Leu Glu Leu Asn Ser
        35                  40                  45

Leu Gly Glu Glu Gln Arg Ile Leu Asn Arg Ser Lys Arg Gly Trp Val
    50                  55                  60

Trp Asn Gln Met Phe Val Leu Glu Glu Phe Ser Gly Pro Glu Pro Ile
65                  70                  75                  80

Leu Val Gly Arg Leu His Thr Asp Leu Asp Pro Gly Ser Lys Lys Ile
                85                  90                  95

Lys Tyr Ile Leu Ser Gly Asp Gly Ala Gly Thr Ile Phe Gln Ile Asn
            100                 105                 110

Asp Val Thr Gly Asp Ile His Ala Ile Lys Arg Leu Asp Arg Glu Glu
        115                 120                 125

Lys Ala Glu Tyr Thr Leu Thr Ala Gln Ala Val Asp Trp Glu Thr Ser
    130                 135                 140

Lys Pro Leu Glu Pro Pro Ser Glu Phe Ile Ile Lys Val Gln Asp Ile
145                 150                 155                 160

Asn Asp Asn Ala Pro Glu Phe Leu Asn Gly Pro Tyr His Ala Thr Val
                165                 170                 175

Pro Glu Met Ser Ile Leu Gly Thr Ser Val Thr Asn Val Thr Ala Thr
            180                 185                 190

Asp Ala Asp Asp Pro Val Tyr Gly Asn Ser Ala Lys Leu Val Tyr Ser
        195                 200                 205

Ile Leu Glu Gly Gln Pro Tyr Phe Ser Ile Glu Pro Glu Thr Ala Ile
    210                 215                 220

Ile Lys Thr Ala Leu Pro Asn Met Asp Arg Glu Ala Lys Glu Glu Tyr
225                 230                 235                 240

Leu Val Val Ile Gln Ala Lys Asp Met Gly Gly His Ser Gly Gly Leu
                245                 250                 255

Ser Gly Thr Thr Thr Leu Thr Val Thr Leu Thr Asp Val Asn Asp Asn
            260                 265                 270

Pro Pro Lys Phe Ala Gln Ser Leu Tyr His Phe Ser Val Pro Glu Asp
        275                 280                 285

Val Val Leu Gly Thr Ala Ile Gly Arg Val Lys Ala Asn Asp Gln Asp
    290                 295                 300
```

```
Ile Gly Glu Asn Ala Gln Ser Ser Tyr Asp Ile Ile Asp Gly Asp Gly
305                 310                 315                 320

Thr Ala Leu Phe Glu Ile Thr Ser Asp Ala Gln Ala Gln Asp Gly Ile
                325                 330                 335

Ile Arg Leu Arg Lys Pro Leu Asp Phe Glu Thr Lys Lys Ser Tyr Thr
            340                 345                 350

Leu Lys Val Glu Ala Ala Asn Val His Ile Asp Pro Arg Phe Ser Gly
        355                 360                 365

Arg Gly Pro Phe Lys Asp Thr Ala Thr Val Lys Ile Val Val Glu Asp
    370                 375                 380

Ala Asp Glu Pro Pro Val Phe Ser Ser Pro Thr Tyr Leu Leu Glu Val
385                 390                 395                 400

His Glu Asn Ala Ala Leu Asn Ser Val Ile Gly Gln Val Thr Ala Arg
                405                 410                 415

Asp Pro Asp Ile Thr Ser Ser Pro Ile Arg Phe Ser Ile Asp Arg His
            420                 425                 430

Thr Asp Leu Glu Arg Gln Phe Asn Ile Asn Ala Asp Asp Gly Lys Ile
        435                 440                 445

Thr Leu Ala Thr Pro Leu Asp Arg Glu Leu Ser Val Trp His Asn Ile
    450                 455                 460

Thr Ile Ile Ala Thr Glu Ile Arg Asn His Ser Gln Ile Ser Arg Val
465                 470                 475                 480

Pro Val Ala Ile Lys Val Leu Asp Val Asn Asp Asn Ala Pro Glu Phe
                485                 490                 495

Ala Ser Glu Tyr Glu Ala Phe Leu Cys Glu Asn Gly Lys Pro Gly Gln
            500                 505                 510

Val Ile Gln Thr Val Ser Ala Met Asp Lys Asp Asp Pro Lys Asn Gly
        515                 520                 525

His Tyr Phe Leu Tyr Ser Leu Leu Pro Glu Met Val Asn Asn Pro Asn
    530                 535                 540

Phe Thr Ile Lys Lys Asn Glu Asp Asn Ser Leu Ser Ile Leu Ala Lys
545                 550                 555                 560

His Asn Gly Phe Asn Arg Gln Lys Gln Glu Val Tyr Leu Leu Pro Ile
                565                 570                 575
```

```
Ile Ile Ser Asp Ser Gly Asn Pro Pro Leu Ser Ser Thr Ser Thr Leu
            580                 585                 590

Thr Ile Arg Val Cys Gly Cys Ser Asn Asp Gly Val Val Gln Ser Cys
        595                 600                 605

Asn Val Glu Ala Tyr Val Leu Pro Ile Gly Leu Ser Met Gly Ala Leu
    610                 615                 620

Ile Ala Ile Leu Ala Cys Ile Ile Leu Leu Leu Val Ile Val Val Leu
625                 630                 635                 640

Phe Val Thr Leu Arg Arg His Lys Asn Glu Pro Leu Ile Ile Lys Asp
                645                 650                 655

Asp Glu Asp Val Arg Glu Asn Ile Ile Arg Tyr Asp Asp Glu Gly Gly
            660                 665                 670

Gly Glu Glu Asp Thr Glu Ala Phe Asp Ile Ala Thr Leu Gln Asn Pro
        675                 680                 685

Asp Gly Ile Asn Gly Phe Leu Pro Arg Lys Asp Ile Lys Pro Asp Leu
    690                 695                 700

Gln Phe Met Pro Arg Gln Gly Leu Ala Pro Val Pro Asn Gly Val Asp
705                 710                 715                 720

Val Asp Glu Phe Ile Asn Val Arg Leu His Glu Ala Asp Asn Asp Pro
                725                 730                 735

Thr Ala Pro Pro Tyr Asp Ser Ile Gln Ile Tyr Gly Tyr Glu Gly Arg
            740                 745                 750

Gly Ser Val Ala Gly Ser Leu Ser Ser Leu Glu Ser Thr Thr Ser Asp
        755                 760                 765

Ser Asp Gln Asn Phe Asp Tyr Leu Ser Asp Trp Gly Pro Arg Phe Lys
    770                 775                 780

Arg Leu Gly Glu Leu Tyr Ser Val Gly Glu Ser Asp Lys Glu Thr
785                 790                 795
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<210> 4

<211> 796

<212> PRT

<213> Homo sapiens

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<400>  4

Met Lys Glu Asn Tyr Cys Leu Gln Ala Ala Leu Val Cys Leu Gly Met
1               5                   10                  15


Leu Cys His Ser His Ala Phe Ala Pro Glu Arg Arg Gly His Leu Arg
            20                  25                  30


Pro Ser Phe His Gly His His Glu Lys Gly Lys Glu Gly Gln Val Leu
        35                  40                  45


Gln Arg Ser Lys Arg Gly Trp Val Trp Asn Gln Phe Phe Val Ile Glu
    50                  55                  60


Glu Tyr Thr Gly Pro Asp Pro Val Leu Val Gly Arg Leu His Ser Asp
65                  70                  75                  80


Ile Asp Ser Gly Asp Gly Asn Ile Lys Tyr Ile Leu Ser Gly Glu Gly
                85                  90                  95


Ala Gly Thr Ile Phe Val Ile Asp Asp Lys Ser Gly Asn Ile His Ala
            100                 105                 110


Thr Lys Thr Leu Asp Arg Glu Glu Arg Ala Gln Tyr Thr Leu Met Ala
        115                 120                 125


Gln Ala Val Asp Arg Asp Thr Asn Arg Pro Leu Glu Pro Pro Ser Glu
    130                 135                 140


Phe Ile Val Lys Val Gln Asp Ile Asn Asp Asn Pro Pro Glu Phe Leu
145                 150                 155                 160


His Glu Thr Tyr His Ala Asn Val Pro Glu Arg Ser Asn Val Gly Thr
                165                 170                 175


Ser Val Ile Gln Val Thr Ala Ser Asp Ala Asp Asp Pro Thr Tyr Gly
            180                 185                 190


Asn Ser Ala Lys Leu Val Tyr Ser Ile Leu Glu Gly Gln Pro Tyr Phe
        195                 200                 205


Ser Val Glu Ala Gln Thr Gly Ile Ile Arg Thr Ala Leu Pro Asn Met
    210                 215                 220


Asp Arg Glu Ala Lys Glu Glu Tyr His Val Val Ile Gln Ala Lys Asp
225                 230                 235                 240


Met Gly Gly His Met Gly Gly Leu Ser Gly Thr Thr Lys Val Thr Ile
                245                 250                 255
```

```
Thr Leu Thr Asp Val Asn Asp Asn Pro Pro Lys Phe Pro Gln Arg Leu
            260                 265                 270

Tyr Gln Met Ser Val Ser Glu Ala Ala Val Pro Gly Glu Glu Val Gly
        275                 280                 285

Arg Val Lys Ala Lys Asp Pro Asp Ile Gly Glu Asn Gly Leu Val Thr
    290                 295                 300

Tyr Asn Ile Val Asp Gly Asp Gly Met Glu Ser Phe Glu Ile Thr Thr
305                 310                 315                 320

Asp Tyr Glu Thr Gln Glu Gly Val Ile Lys Leu Lys Lys Pro Val Asp
                325                 330                 335

Phe Glu Thr Glu Arg Ala Tyr Ser Leu Lys Val Glu Ala Ala Asn Val
            340                 345                 350

His Ile Asp Pro Lys Phe Ile Ser Asn Gly Pro Phe Lys Asp Thr Val
        355                 360                 365

Thr Val Lys Ile Ser Val Glu Asp Ala Asp Glu Pro Pro Met Phe Leu
    370                 375                 380

Ala Pro Ser Tyr Ile His Glu Val Gln Glu Asn Ala Ala Ala Gly Thr
385                 390                 395                 400

Val Val Gly Arg Val His Ala Lys Asp Pro Asp Ala Ala Asn Ser Pro
                405                 410                 415

Ile Arg Tyr Ser Ile Asp Arg His Thr Asp Leu Asp Arg Phe Phe Thr
            420                 425                 430

Ile Asn Pro Glu Asp Gly Phe Ile Lys Thr Thr Lys Pro Leu Asp Arg
        435                 440                 445

Glu Glu Thr Ala Trp Leu Asn Ile Thr Val Phe Ala Ala Glu Ile His
    450                 455                 460

Asn Arg His Gln Glu Ala Gln Val Pro Val Ala Ile Arg Val Leu Asp
465                 470                 475                 480

Val Asn Asp Asn Ala Pro Lys Phe Ala Ala Pro Tyr Glu Gly Phe Ile
                485                 490                 495

Cys Glu Ser Asp Gln Thr Lys Pro Leu Ser Asn Gln Pro Ile Val Thr
            500                 505                 510

Ile Ser Ala Asp Asp Lys Asp Asp Thr Ala Asn Gly Pro Arg Phe Ile
        515                 520                 525
```

```
Phe Ser Leu Pro Pro Glu Ile Ile His Asn Pro Asn Phe Thr Val Arg
    530                 535                 540

Asp Asn Arg Asp Asn Thr Ala Gly Val Tyr Ala Arg Arg Gly Gly Phe
545                 550                 555                 560

Ser Arg Gln Lys Gln Asp Leu Tyr Leu Leu Pro Ile Val Ile Ser Asp
                565                 570                 575

Gly Gly Ile Pro Pro Met Ser Ser Thr Asn Thr Leu Thr Ile Lys Val
            580                 585                 590

Cys Gly Cys Asp Val Asn Gly Ala Leu Leu Ser Cys Asn Ala Glu Ala
        595                 600                 605

Tyr Ile Leu Asn Ala Gly Leu Ser Thr Gly Ala Leu Ile Ala Ile Leu
    610                 615                 620

Ala Cys Ile Val Ile Leu Leu Val Ile Val Val Leu Phe Val Thr Leu
625                 630                 635                 640

Arg Arg Gln Lys Lys Glu Pro Leu Ile Val Phe Glu Glu Glu Asp Val
                645                 650                 655

Arg Glu Asn Ile Ile Thr Tyr Asp Asp Glu Gly Gly Gly Glu Glu Asp
            660                 665                 670

Thr Glu Ala Phe Asp Ile Ala Thr Leu Gln Asn Pro Asp Gly Ile Asn
        675                 680                 685

Gly Phe Ile Pro Arg Lys Asp Ile Lys Pro Glu Tyr Gln Tyr Met Pro
    690                 695                 700

Arg Pro Gly Leu Arg Pro Ala Pro Asn Ser Val Asp Val Asp Asp Phe
705                 710                 715                 720

Ile Asn Thr Arg Ile Gln Glu Ala Asp Asn Asp Pro Thr Ala Pro Pro
                725                 730                 735

Tyr Asp Ser Ile Gln Ile Tyr Gly Tyr Glu Gly Arg Gly Ser Val Ala
            740                 745                 750

Gly Ser Leu Ser Ser Leu Glu Ser Ala Thr Thr Asp Ser Asp Leu Asp
        755                 760                 765

Tyr Asp Tyr Leu Gln Asn Trp Gly Pro Arg Phe Lys Lys Leu Ala Asp
    770                 775                 780

Leu Tyr Gly Ser Lys Asp Thr Phe Asp Asp Asp Ser
785                 790                 795
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<210>  5

<211>  784

<212>  PRT

<213>  Homo sapiens


<400>  5

Met Gln Arg Leu Met Met Leu Leu Ala Thr Ser Gly Ala Cys Leu Gly
1               5                   10                  15


Leu Leu Ala Val Ala Ala Val Ala Ala Ala Gly Ala Asn Pro Ala Gln
            20                  25                  30


Arg Asp Thr His Ser Leu Leu Pro Thr His Arg Arg Gln Lys Arg Asp
        35                  40                  45


Trp Ile Trp Asn Gln Met His Ile Asp Glu Glu Lys Asn Thr Ser Leu
    50                  55                  60


Pro His His Val Gly Lys Ile Lys Ser Ser Val Ser Arg Lys Asn Ala
65                  70                  75                  80


Lys Tyr Leu Leu Lys Gly Glu Tyr Val Gly Lys Val Phe Arg Val Asp
                85                  90                  95


Ala Glu Thr Gly Asp Val Phe Ala Ile Glu Arg Leu Asp Arg Glu Asn
            100                 105                 110


Ile Ser Glu Tyr His Leu Thr Ala Val Ile Val Asp Lys Asp Thr Gly
        115                 120                 125


Glu Asn Leu Glu Thr Pro Ser Ser Phe Thr Ile Lys Val His Asp Val
    130                 135                 140


Asn Asp Asn Trp Pro Val Phe Thr His Arg Leu Phe Asn Ala Ser Val
145                 150                 155                 160


Pro Glu Ser Ser Ala Val Gly Thr Ser Val Ile Ser Val Thr Ala Val
                165                 170                 175


Asp Ala Asp Asp Pro Thr Val Gly Asp His Ala Ser Val Met Tyr Gln
            180                 185                 190


Ile Leu Lys Gly Lys Glu Tyr Phe Ala Ile Asp Asn Ser Gly Arg Ile
        195                 200                 205


Ile Thr Ile Thr Lys Ser Leu Asp Arg Glu Lys Gln Ala Arg Tyr Glu
```

```
    210                 215                 220

Ile Val Val Glu Ala Arg Asp Ala Gln Gly Leu Arg Gly Asp Ser Gly
225                 230                 235                 240

Thr Ala Thr Val Leu Val Thr Leu Gln Asp Ile Asn Asp Asn Phe Pro
                245                 250                 255

Phe Phe Thr Gln Thr Lys Tyr Thr Phe Val Val Pro Glu Asp Thr Arg
            260                 265                 270

Val Gly Thr Ser Val Gly Ser Leu Phe Val Glu Asp Pro Asp Glu Pro
        275                 280                 285

Gln Asn Arg Met Thr Lys Tyr Ser Ile Leu Arg Gly Asp Tyr Gln Asp
    290                 295                 300

Ala Phe Thr Ile Glu Thr Asn Pro Ala His Asn Glu Gly Ile Ile Lys
305                 310                 315                 320

Pro Met Lys Pro Leu Asp Tyr Glu Tyr Ile Gln Gln Tyr Ser Phe Ile
                325                 330                 335

Val Glu Ala Thr Asp Pro Thr Ile Asp Leu Arg Tyr Met Ser Pro Pro
            340                 345                 350

Ala Gly Asn Arg Ala Gln Val Ile Ile Asn Ile Thr Asp Val Asp Glu
        355                 360                 365

Pro Pro Ile Phe Gln Gln Pro Phe Tyr His Phe Gln Leu Lys Glu Asn
    370                 375                 380

Gln Lys Lys Pro Leu Ile Gly Thr Val Leu Ala Met Asp Pro Asp Ala
385                 390                 395                 400

Ala Arg His Ser Ile Gly Tyr Ser Ile Arg Arg Thr Ser Asp Lys Gly
                405                 410                 415

Gln Phe Phe Arg Val Thr Lys Lys Gly Asp Ile Tyr Asn Glu Lys Glu
            420                 425                 430

Leu Asp Arg Glu Val Tyr Pro Trp Tyr Asn Leu Thr Val Glu Ala Lys
        435                 440                 445

Glu Leu Asp Ser Thr Gly Thr Pro Thr Gly Lys Glu Ser Ile Val Gln
    450                 455                 460

Val His Ile Glu Val Leu Asp Glu Asn Asp Asn Ala Pro Glu Phe Ala
465                 470                 475                 480
```

```
Lys Pro Tyr Gln Pro Lys Val Cys Glu Asn Ala Val His Gly Gln Leu
                485                 490                 495

Val Leu Gln Ile Ser Ala Ile Asp Lys Asp Ile Thr Pro Arg Asn Val
            500                 505                 510

Lys Phe Lys Phe Thr Leu Asn Thr Glu Asn Asn Phe Thr Leu Thr Asp
        515                 520                 525

Asn His Asp Asn Thr Ala Asn Ile Thr Val Lys Tyr Gly Gln Phe Asp
    530                 535                 540

Arg Glu His Thr Lys Val His Phe Leu Pro Val Val Ile Ser Asp Asn
545                 550                 555                 560

Gly Met Pro Ser Arg Thr Gly Thr Ser Thr Leu Thr Val Ala Val Cys
                565                 570                 575

Lys Cys Asn Glu Gln Gly Glu Phe Thr Phe Cys Glu Asp Met Ala Ala
            580                 585                 590

Gln Val Gly Val Ser Ile Gln Ala Val Val Ala Ile Leu Leu Cys Ile
        595                 600                 605

Leu Thr Ile Thr Val Ile Thr Leu Leu Ile Phe Leu Arg Arg Arg Leu
    610                 615                 620

Arg Lys Gln Ala Arg Ala His Gly Lys Ser Val Pro Glu Ile His Glu
625                 630                 635                 640

Gln Leu Val Thr Tyr Asp Glu Glu Gly Gly Gly Glu Met Asp Thr Thr
                645                 650                 655

Ser Tyr Asp Val Ser Val Leu Asn Ser Val Arg Arg Gly Gly Ala Lys
            660                 665                 670

Pro Pro Arg Pro Ala Leu Asp Ala Arg Pro Ser Leu Tyr Ala Gln Val
        675                 680                 685

Gln Lys Pro Pro Arg His Ala Pro Gly Ala His Gly Gly Pro Gly Glu
    690                 695                 700

Met Ala Ala Met Ile Glu Val Lys Lys Asp Glu Ala Asp His Asp Gly
705                 710                 715                 720

Asp Gly Pro Pro Tyr Asp Thr Leu His Ile Tyr Gly Tyr Glu Gly Ser
                725                 730                 735

Glu Ser Ile Ala Glu Ser Leu Ser Ser Leu Gly Thr Asp Ser Ser Asp
            740                 745                 750
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Ser Asp Val Asp Tyr Asp Phe Leu Asn Asp Trp Gly Pro Arg Phe Lys
755 760 765

Met Leu Ala Glu Leu Tyr Gly Ser Asp Pro Arg Glu Glu Leu Leu Tyr
770 775 780

<210> 6

<211> 829

<212> PRT

<213> Homo sapiens

<400> 6

Met Gly Leu Pro Arg Gly Pro Leu Ala Ser Leu Leu Leu Leu Gln Val
1 5 10 15

Cys Trp Leu Gln Cys Ala Ala Ser Glu Pro Cys Arg Ala Val Phe Arg
20 25 30

Glu Ala Glu Val Thr Leu Glu Ala Gly Gly Ala Glu Gln Glu Pro Gly
35 40 45

Gln Ala Leu Gly Lys Val Phe Met Gly Cys Pro Gly Gln Glu Pro Ala
50 55 60

Leu Phe Ser Thr Asp Asn Asp Asp Phe Thr Val Arg Asn Gly Glu Thr
65 70 75 80

Val Gln Glu Arg Arg Ser Leu Lys Glu Arg Asn Pro Leu Lys Ile Phe
85 90 95

Pro Ser Lys Arg Ile Leu Arg Arg His Lys Arg Asp Trp Val Val Ala
100 105 110

Pro Ile Ser Val Pro Glu Asn Gly Lys Gly Pro Phe Pro Gln Arg Leu
115 120 125

Asn Gln Leu Lys Ser Asn Lys Asp Arg Asp Thr Lys Ile Phe Tyr Ser
130 135 140

Ile Thr Gly Pro Gly Ala Asp Ser Pro Pro Glu Gly Val Phe Ala Val
145 150 155 160

Glu Lys Glu Thr Gly Trp Leu Leu Leu Asn Lys Pro Leu Asp Arg Glu
165 170 175

Glu Ile Ala Lys Tyr Glu Leu Phe Gly His Ala Val Ser Glu Asn Gly
180 185 190

Ala Ser Val Glu Asp Pro Met Asn Ile Ser Ile Ile Val Thr Asp Gln
195 200 205

Asn Asp His Lys Pro Lys Phe Thr Gln Asp Thr Phe Arg Gly Ser Val
210 215 220

Leu Glu Gly Val Leu Pro Gly Thr Ser Val Met Gln Val Thr Ala Thr
225 230 235 240

Asp Glu Asp Asp Ala Ile Tyr Thr Tyr Asn Gly Val Val Ala Tyr Ser
245 250 255

Ile His Ser Gln Glu Pro Lys Asp Pro His Asp Leu Met Phe Thr Ile
260 265 270

His Arg Ser Thr Gly Thr Ile Ser Val Ile Ser Ser Gly Leu Asp Arg
275 280 285

Glu Lys Val Pro Glu Tyr Thr Leu Thr Ile Gln Ala Thr Asp Met Asp
290 295 300

Gly Asp Gly Ser Thr Thr Thr Ala Val Ala Val Val Glu Ile Leu Asp
305 310 315 320

Ala Asn Asp Asn Ala Pro Met Phe Asp Pro Gln Lys Tyr Glu Ala His
325 330 335

Val Pro Glu Asn Ala Val Gly His Glu Val Gln Arg Leu Thr Val Thr
340 345 350

Asp Leu Asp Ala Pro Asn Ser Pro Ala Trp Arg Ala Thr Tyr Leu Ile
355 360 365

Met Gly Gly Asp Asp Gly Asp His Phe Thr Ile Thr Thr His Pro Glu
370 375 380

Ser Asn Gln Gly Ile Leu Thr Thr Arg Lys Gly Leu Asp Phe Glu Ala
385 390 395 400

Lys Asn Gln His Thr Leu Tyr Val Glu Val Thr Asn Glu Ala Pro Phe
405 410 415

Val Leu Lys Leu Pro Thr Ser Thr Ala Thr Ile Val Val His Val Glu
420 425 430

Asp Val Asn Glu Ala Pro Val Phe Val Pro Pro Ser Lys Val Val Glu
435 440 445

Val Gln Glu Gly Ile Pro Thr Gly Glu Pro Val Cys Val Tyr Thr Ala

450 455 460

Glu Asp Pro Asp Lys Glu Asn Gln Lys Ile Ser Tyr Arg Ile Leu Arg
465 470 475 480

Asp Pro Ala Gly Trp Leu Ala Met Asp Pro Asp Ser Gly Gln Val Thr
485 490 495

Ala Val Gly Thr Leu Asp Arg Glu Asp Glu Gln Phe Val Arg Asn Asn
500 505 510

Ile Tyr Glu Val Met Val Leu Ala Met Asp Asn Gly Ser Pro Pro Thr
515 520 525

Thr Gly Thr Gly Thr Leu Leu Leu Thr Leu Ile Asp Val Asn Asp His
530 535 540

Gly Pro Val Pro Glu Pro Arg Gln Ile Thr Ile Cys Asn Gln Ser Pro
545 550 555 560

Val Arg His Val Leu Asn Ile Thr Asp Lys Asp Leu Ser Pro His Thr
565 570 575

Ser Pro Phe Gln Ala Gln Leu Thr Asp Asp Ser Asp Ile Tyr Trp Thr
580 585 590

Ala Glu Val Asn Glu Glu Gly Asp Thr Val Val Leu Ser Leu Lys Lys
595 600 605

Phe Leu Lys Gln Asp Thr Tyr Asp Val His Leu Ser Leu Ser Asp His
610 615 620

Gly Asn Lys Glu Gln Leu Thr Val Ile Arg Ala Thr Val Cys Asp Cys
625 630 635 640

His Gly His Val Glu Thr Cys Pro Gly Pro Trp Lys Gly Gly Phe Ile
645 650 655

Leu Pro Val Leu Gly Ala Val Leu Ala Leu Leu Phe Leu Leu Leu Val
660 665 670

Leu Leu Leu Leu Val Arg Lys Lys Arg Lys Ile Lys Glu Pro Leu Leu
675 680 685

Leu Pro Glu Asp Asp Thr Arg Asp Asn Val Phe Tyr Tyr Gly Glu Glu
690 695 700

Gly Gly Gly Glu Glu Asp Gln Asp Tyr Asp Ile Thr Gln Leu His Arg
705 710 715 720

```
Gly Leu Glu Ala Arg Pro Glu Val Val Leu Arg Asn Asp Val Ala Pro
                725                 730                 735

Thr Ile Ile Pro Thr Pro Met Tyr Arg Pro Arg Pro Ala Asn Pro Asp
            740                 745                 750

Glu Ile Gly Asn Phe Ile Ile Glu Asn Leu Lys Ala Ala Asn Thr Asp
        755                 760                 765

Pro Thr Ala Pro Pro Tyr Asp Thr Leu Leu Val Phe Asp Tyr Glu Gly
    770                 775                 780

Ser Gly Ser Asp Ala Ala Ser Leu Ser Ser Leu Thr Ser Ser Ala Ser
785                 790                 795                 800

Asp Gln Asp Gln Asp Tyr Asp Tyr Leu Asn Glu Trp Gly Ser Arg Phe
                805                 810                 815

Lys Lys Leu Ala Asp Met Tyr Gly Gly Gly Glu Asp Asp
            820                 825


<210>  7

<211>  882

<212>  PRT

<213>  Homo sapiens


<400>  7

Met Gly Pro Trp Ser Arg Ser Leu Ser Ala Leu Leu Leu Leu Leu Gln
1               5                   10                  15

Val Ser Ser Trp Leu Cys Gln Glu Pro Glu Pro Cys His Pro Gly Phe
            20                  25                  30

Asp Ala Glu Ser Tyr Thr Phe Thr Val Pro Arg Arg His Leu Glu Arg
        35                  40                  45

Gly Arg Val Leu Gly Arg Val Asn Phe Glu Asp Cys Thr Gly Arg Gln
    50                  55                  60

Arg Thr Ala Tyr Phe Ser Leu Asp Thr Arg Phe Lys Val Gly Thr Asp
65                  70                  75                  80

Gly Val Ile Thr Val Lys Arg Pro Leu Arg Phe His Asn Pro Gln Ile
                85                  90                  95

His Phe Leu Val Tyr Ala Trp Asp Ser Thr Tyr Arg Lys Phe Ser Thr
            100                 105                 110
```

```
Lys Val Thr Leu Asn Thr Val Gly His His His Arg Pro Pro Pro His
        115                 120                 125

Gln Ala Ser Val Ser Gly Ile Gln Ala Glu Leu Leu Thr Phe Pro Asn
    130                 135                 140

Ser Ser Pro Gly Leu Arg Arg Gln Lys Arg Asp Trp Val Ile Pro Pro
145                 150                 155                 160

Ile Ser Cys Pro Glu Asn Glu Lys Gly Pro Phe Pro Lys Asn Leu Val
                165                 170                 175

Gln Ile Lys Ser Asn Lys Asp Lys Glu Gly Lys Val Phe Tyr Ser Ile
            180                 185                 190

Thr Gly Gln Gly Ala Asp Thr Pro Pro Val Gly Val Phe Ile Ile Glu
        195                 200                 205

Arg Glu Thr Gly Trp Leu Lys Val Thr Glu Pro Leu Asp Arg Glu Arg
    210                 215                 220

Ile Ala Thr Tyr Thr Leu Phe Ser His Ala Val Ser Ser Asn Gly Asn
225                 230                 235                 240

Ala Val Glu Asp Pro Met Glu Ile Leu Ile Thr Val Thr Asp Gln Asn
                245                 250                 255

Asp Asn Lys Pro Glu Phe Thr Gln Glu Val Phe Lys Gly Ser Val Met
            260                 265                 270

Glu Gly Ala Leu Pro Gly Thr Ser Val Met Glu Val Thr Ala Thr Asp
        275                 280                 285

Ala Asp Asp Asp Val Asn Thr Tyr Asn Ala Ala Ile Ala Tyr Thr Ile
    290                 295                 300

Leu Ser Gln Asp Pro Glu Leu Pro Asp Lys Asn Met Phe Thr Ile Asn
305                 310                 315                 320

Arg Asn Thr Gly Val Ile Ser Val Val Thr Thr Gly Leu Asp Arg Glu
                325                 330                 335

Ser Phe Pro Thr Tyr Thr Leu Val Val Gln Ala Ala Asp Leu Gln Gly
            340                 345                 350

Glu Gly Leu Ser Thr Thr Ala Thr Ala Val Ile Thr Val Thr Asp Thr
        355                 360                 365

Asn Asp Asn Pro Pro Ile Phe Asn Pro Thr Thr Tyr Lys Gly Gln Val
    370                 375                 380
```

```
Pro Glu Asn Glu Ala Asn Val Val Ile Thr Thr Leu Lys Val Thr Asp
385                 390                 395                 400

Ala Asp Ala Pro Asn Thr Pro Ala Trp Glu Ala Val Tyr Thr Ile Leu
                405                 410                 415

Asn Asp Asp Gly Gly Gln Phe Val Val Thr Thr Asn Pro Val Asn Asn
            420                 425                 430

Asp Gly Ile Leu Lys Thr Ala Lys Gly Leu Asp Phe Glu Ala Lys Gln
        435                 440                 445

Gln Tyr Ile Leu His Val Ala Val Thr Asn Val Val Pro Phe Glu Val
    450                 455                 460

Ser Leu Thr Thr Ser Thr Ala Thr Val Thr Val Asp Val Leu Asp Val
465                 470                 475                 480

Asn Glu Ala Pro Ile Phe Val Pro Pro Glu Lys Arg Val Glu Val Ser
                485                 490                 495

Glu Asp Phe Gly Val Gly Gln Glu Ile Thr Ser Tyr Thr Ala Gln Glu
            500                 505                 510

Pro Asp Thr Phe Met Glu Gln Lys Ile Thr Tyr Arg Ile Trp Arg Asp
        515                 520                 525

Thr Ala Asn Trp Leu Glu Ile Asn Pro Asp Thr Gly Ala Ile Ser Thr
    530                 535                 540

Arg Ala Glu Leu Asp Arg Glu Asp Phe Glu His Val Lys Asn Ser Thr
545                 550                 555                 560

Tyr Thr Ala Leu Ile Ile Ala Thr Asp Asn Gly Ser Pro Val Ala Thr
                565                 570                 575

Gly Thr Gly Thr Leu Leu Leu Ile Leu Ser Asp Val Asn Asp Asn Ala
            580                 585                 590

Pro Ile Pro Glu Pro Arg Thr Ile Phe Phe Cys Glu Arg Asn Pro Lys
        595                 600                 605

Pro Gln Val Ile Asn Ile Ile Asp Ala Asp Leu Pro Pro Asn Thr Ser
    610                 615                 620

Pro Phe Thr Ala Glu Leu Thr His Gly Ala Ser Ala Asn Trp Thr Ile
625                 630                 635                 640

Gln Tyr Asn Asp Pro Thr Gln Glu Ser Ile Ile Leu Lys Pro Lys Met
```

645 650 655

Ala Leu Glu Val Gly Asp Tyr Lys Ile Asn Leu Lys Leu Met Asp Asn
660 665 670

Gln Asn Lys Asp Gln Val Thr Thr Leu Glu Val Ser Val Cys Asp Cys
675 680 685

Glu Gly Ala Ala Gly Val Cys Arg Lys Ala Gln Pro Val Glu Ala Gly
690 695 700

Leu Gln Ile Pro Ala Ile Leu Gly Ile Leu Gly Gly Ile Leu Ala Leu
705 710 715 720

Leu Ile Leu Ile Leu Leu Leu Leu Leu Phe Leu Arg Arg Arg Ala Val
725 730 735

Val Lys Glu Pro Leu Leu Pro Pro Glu Asp Asp Thr Arg Asp Asn Val
740 745 750

Tyr Tyr Tyr Asp Glu Glu Gly Gly Gly Glu Glu Asp Gln Asp Phe Asp
755 760 765

Leu Ser Gln Leu His Arg Gly Leu Asp Ala Arg Pro Glu Val Thr Arg
770 775 780

Asn Asp Val Ala Pro Thr Leu Met Ser Val Pro Arg Tyr Leu Pro Arg
785 790 795 800

Pro Ala Asn Pro Asp Glu Ile Gly Asn Phe Ile Asp Glu Asn Leu Lys
805 810 815

Ala Ala Asp Thr Asp Pro Thr Ala Pro Pro Tyr Asp Ser Leu Leu Val
820 825 830

Phe Asp Tyr Glu Gly Ser Gly Ser Glu Ala Ala Ser Leu Ser Ser Leu
835 840 845

Asn Ser Ser Glu Ser Asp Lys Asp Gln Asp Tyr Asp Tyr Leu Asn Glu
850 855 860

Trp Gly Asn Arg Phe Lys Lys Leu Ala Asp Met Tyr Gly Gly Gly Glu
865 870 875 880

Asp Asp

<210> 8

<211> 900

<212> PRT

<213> Homo sapiens

<400> 8

Met Cys Arg Ile Ala Gly Ala Leu Arg Thr Leu Leu Pro Leu Leu Leu
1 5 10 15

Ala Leu Leu Gln Ala Ser Val Glu Ala Ser Gly Glu Ile Ala Leu Cys
20 25 30

Lys Thr Gly Phe Pro Glu Asp Val Tyr Ser Ala Val Leu Ser Lys Asp
35 40 45

Val His Glu Gly Gln Pro Leu Leu Asn Val Lys Phe Ser Asn Cys Asn
50 55 60

Gly Lys Arg Lys Val Gln Tyr Glu Ser Ser Glu Pro Ala Asp Phe Lys
65 70 75 80

Val Asp Glu Asp Gly Met Val Tyr Ala Val Arg Ser Phe Pro Leu Ser
85 90 95

Ser Glu His Ala Lys Phe Leu Ile Tyr Ala Gln Asp Lys Glu Thr Gln
100 105 110

Glu Lys Trp Gln Val Ala Val Lys Leu Ser Leu Lys Pro Thr Leu Thr
115 120 125

Glu Glu Ser Val Lys Glu Ser Ala Glu Val Glu Glu Ile Val Phe Pro
130 135 140

Arg Gln Phe Ser Lys His Ser Gly His Leu Gln Arg Gln Lys Arg Asp
145 150 155 160

Trp Val Ile Pro Pro Ile Asn Leu Pro Glu Asn Ser Arg Gly Pro Phe
165 170 175

Pro Gln Glu Leu Val Arg Ile Arg Ser Asp Arg Asp Lys Asn Leu Ser
180 185 190

Leu Arg Tyr Ser Val Thr Gly Pro Gly Ala Asp Gln Pro Pro Thr Gly
195 200 205

Ile Phe Ile Ile Asn Pro Ile Ser Gly Gln Leu Ser Val Thr Lys Pro
210 215 220

Leu Asp Arg Glu Gln Ile Ala Arg Phe His Leu Arg Ala His Ala Val
225 230 235 240

```
Asp Ile Asn Gly Asn Gln Val Glu Asn Pro Ile Asp Ile Val Ile Asn
                245                 250                 255

Val Ile Asp Met Asn Asp Asn Arg Pro Glu Phe Leu His Gln Val Trp
            260                 265                 270

Asn Gly Thr Val Pro Glu Gly Ser Lys Pro Gly Thr Tyr Val Met Thr
        275                 280                 285

Val Thr Ala Ile Asp Ala Asp Asp Pro Asn Ala Leu Asn Gly Met Leu
    290                 295                 300

Arg Tyr Arg Ile Val Ser Gln Ala Pro Ser Thr Pro Ser Pro Asn Met
305                 310                 315                 320

Phe Thr Ile Asn Asn Glu Thr Gly Asp Ile Ile Thr Val Ala Ala Gly
                325                 330                 335

Leu Asp Arg Glu Lys Val Gln Gln Tyr Thr Leu Ile Ile Gln Ala Thr
            340                 345                 350

Asp Met Glu Gly Asn Pro Thr Tyr Gly Leu Ser Asn Thr Ala Thr Ala
        355                 360                 365

Val Ile Thr Val Thr Asp Val Asn Asp Asn Pro Pro Glu Phe Thr Ala
    370                 375                 380

Met Thr Phe Tyr Gly Glu Val Pro Glu Asn Arg Val Asp Ile Ile Val
385                 390                 395                 400

Ala Asn Leu Thr Val Thr Asp Lys Asp Gln Pro His Thr Pro Ala Trp
                405                 410                 415

Asn Ala Val Tyr Arg Ile Ser Gly Gly Asp Pro Thr Gly Arg Phe Ala
            420                 425                 430

Ile Gln Thr Asp Pro Asn Ser Asn Asp Gly Leu Val Thr Val Val Lys
        435                 440                 445

Pro Ile Asp Phe Glu Thr Asn Arg Met Phe Val Leu Thr Val Ala Ala
    450                 455                 460

Glu Asn Gln Val Pro Leu Ala Lys Gly Ile Gln His Pro Pro Gln Ser
465                 470                 475                 480

Thr Ala Thr Val Ser Val Thr Val Ile Asp Val Asn Glu Asn Pro Tyr
                485                 490                 495

Phe Ala Pro Asn Pro Lys Ile Ile Arg Gln Glu Glu Gly Leu His Ala
            500                 505                 510
```

Gly Thr Met Leu Thr Thr Phe Thr Ala Gln Asp Pro Asp Arg Tyr Met
515 520 525

Gln Gln Asn Ile Arg Tyr Thr Lys Leu Ser Asp Pro Ala Asn Trp Leu
530 535 540

Lys Ile Asp Pro Val Asn Gly Gln Ile Thr Thr Ile Ala Val Leu Asp
545 550 555 560

Arg Glu Ser Pro Asn Val Lys Asn Asn Ile Tyr Asn Ala Thr Phe Leu
565 570 575

Ala Ser Asp Asn Gly Ile Pro Pro Met Ser Gly Thr Gly Thr Leu Gln
580 585 590

Ile Tyr Leu Leu Asp Ile Asn Asp Asn Ala Pro Gln Val Leu Pro Gln
595 600 605

Glu Ala Glu Thr Cys Glu Thr Pro Asp Pro Asn Ser Ile Asn Ile Thr
610 615 620

Ala Leu Asp Tyr Asp Ile Asp Pro Asn Ala Gly Pro Phe Ala Phe Asp
625 630 635 640

Leu Pro Leu Ser Pro Val Thr Ile Lys Arg Asn Trp Thr Ile Thr Arg
645 650 655

Leu Asn Gly Asp Phe Ala Gln Leu Asn Leu Lys Ile Lys Phe Leu Glu
660 665 670

Ala Gly Ile Tyr Glu Val Pro Ile Ile Ile Thr Asp Ser Gly Asn Pro
675 680 685

Pro Lys Ser Asn Ile Ser Ile Leu Arg Val Lys Val Cys Gln Cys Asp
690 695 700

Ser Asn Gly Asp Cys Thr Asp Val Asp Arg Ile Val Gly Ala Gly Leu
705 710 715 720

Gly Thr Gly Ala Ile Ile Ala Ile Leu Leu Cys Ile Ile Ile Leu Leu
725 730 735

Ile Leu Val Leu Met Phe Val Val Trp Met Lys Arg Arg Asp Lys Glu
740 745 750

Arg Gln Ala Lys Gln Leu Leu Ile Asp Pro Glu Asp Asp Val Arg Asp
755 760 765

Asn Ile Leu Lys Tyr Asp Glu Glu Gly Gly Gly Glu Glu Asp Gln Asp

770 775 780

Tyr Asp Leu Ser Gln Leu Gln Gln Pro Asp Thr Val Glu Pro Asp Ala
785 790 795 800

Ile Lys Pro Val Gly Ile Arg Arg Met Asp Glu Arg Pro Ile His Ala
805 810 815

Glu Pro Gln Tyr Pro Val Arg Ser Ala Ala Pro His Pro Gly Asp Ile
820 825 830

Gly Asp Phe Ile Asn Glu Gly Leu Lys Ala Ala Asp Asn Asp Pro Thr
835 840 845

Ala Pro Pro Tyr Asp Ser Leu Leu Val Phe Asp Tyr Glu Gly Ser Gly
850 855 860

Ser Thr Ala Gly Ser Leu Ser Ser Leu Asn Ser Ser Ser Ser Gly Gly
865 870 875 880

Glu Gln Asp Tyr Asp Tyr Leu Asn Asp Trp Gly Pro Arg Phe Lys Lys
885 890 895

Leu Ala Asp Met
900

<210> 9

<211> 916

<212> PRT

<213> Homo sapiens

<400> 9

Met Thr Ala Gly Ala Gly Val Leu Leu Leu Leu Leu Ser Leu Ser Gly
1 5 10 15

Ala Leu Arg Ala His Asn Glu Asp Leu Thr Thr Arg Glu Thr Cys Lys
20 25 30

Ala Gly Phe Ser Glu Asp Asp Tyr Thr Ala Leu Ile Ser Gln Asn Ile
35 40 45

Leu Glu Gly Glu Lys Leu Leu Gln Val Lys Phe Ser Ser Cys Val Gly
50 55 60

Thr Lys Gly Thr Gln Tyr Glu Thr Asn Ser Met Asp Phe Lys Val Gly
65 70 75 80

```
Ala Asp Gly Thr Val Phe Ala Thr Arg Glu Leu Gln Val Pro Ser Glu
                85                  90                  95

Gln Val Ala Phe Thr Val Thr Ala Trp Asp Ser Gln Thr Ala Glu Lys
            100                 105                 110

Trp Asp Ala Val Val Arg Leu Leu Val Ala Gln Thr Ser Ser Pro His
        115                 120                 125

Ser Gly His Lys Pro Gln Lys Gly Lys Lys Val Val Ala Leu Asp Pro
    130                 135                 140

Ser Pro Pro Pro Lys Asp Thr Leu Leu Pro Trp Pro Gln His Gln Asn
145                 150                 155                 160

Ala Asn Gly Leu Arg Arg Arg Lys Arg Asp Trp Val Ile Pro Pro Ile
                165                 170                 175

Asn Val Pro Glu Asn Ser Arg Gly Pro Phe Pro Gln Gln Leu Val Arg
            180                 185                 190

Ile Arg Ser Asp Lys Asp Asn Asp Ile Pro Ile Arg Tyr Ser Ile Thr
        195                 200                 205

Gly Val Gly Ala Asp Gln Pro Pro Met Glu Val Phe Ser Ile Asn Ser
    210                 215                 220

Met Ser Gly Arg Met Tyr Val Thr Arg Pro Met Asp Arg Glu Glu His
225                 230                 235                 240

Ala Ser Tyr His Leu Arg Ala His Ala Val Asp Met Asn Gly Asn Lys
                245                 250                 255

Val Glu Asn Pro Ile Asp Leu Tyr Ile Tyr Val Ile Asp Met Asn Asp
            260                 265                 270

Asn His Pro Glu Phe Ile Asn Gln Val Tyr Asn Cys Ser Val Asp Glu
        275                 280                 285

Gly Ser Lys Pro Gly Thr Tyr Val Met Thr Ile Thr Ala Asn Asp Ala
    290                 295                 300

Asp Asp Ser Thr Thr Ala Asn Gly Met Val Arg Tyr Arg Ile Val Thr
305                 310                 315                 320

Gln Thr Pro Gln Ser Pro Ser Gln Asn Met Phe Thr Ile Asn Ser Glu
                325                 330                 335

Thr Gly Asp Ile Val Thr Val Ala Ala Gly Trp Asp Arg Glu Lys Val
            340                 345                 350
```

```
Gln Gln Tyr Thr Val Ile Val Gln Ala Thr Asp Met Glu Gly Asn Leu
        355                 360                 365

Asn Tyr Gly Leu Ser Asn Thr Ala Thr Ala Ile Ile Thr Val Thr Asp
    370                 375                 380

Val Asn Asp Asn Pro Ser Glu Phe Thr Ala Ser Thr Phe Ala Gly Glu
385                 390                 395                 400

Val Pro Glu Asn Ser Val Glu Thr Val Val Ala Asn Leu Thr Val Met
                405                 410                 415

Asp Arg Asp Gln Pro His Ser Pro Asn Trp Asn Ala Val Tyr Arg Ile
            420                 425                 430

Ile Ser Gly Asp Pro Ser Gly His Phe Ser Val Arg Thr Asp Pro Val
        435                 440                 445

Thr Asn Glu Gly Met Val Thr Val Val Lys Ala Val Asp Tyr Glu Leu
    450                 455                 460

Asn Arg Ala Phe Met Leu Thr Val Met Val Ser Asn Gln Ala Pro Leu
465                 470                 475                 480

Ala Ser Gly Ile Gln Met Ser Phe Gln Ser Thr Ala Gly Val Thr Ile
                485                 490                 495

Ser Ile Met Asp Ile Asn Glu Ala Pro Tyr Phe Pro Ser Asn His Lys
            500                 505                 510

Leu Ile Arg Leu Glu Glu Gly Val Pro Pro Gly Thr Val Leu Thr Thr
        515                 520                 525

Phe Ser Ala Val Asp Pro Asp Arg Phe Met Gln Gln Ala Val Arg Tyr
    530                 535                 540

Ser Lys Leu Ser Asp Pro Ala Ser Trp Leu His Ile Asn Ala Thr Asn
545                 550                 555                 560

Gly Gln Ile Thr Thr Val Ala Val Leu Asp Arg Glu Ser Leu Tyr Thr
                565                 570                 575

Lys Asn Asn Val Tyr Glu Ala Thr Phe Leu Ala Ala Asp Asn Gly Ile
            580                 585                 590

Pro Pro Ala Ser Gly Thr Gly Thr Leu Gln Ile Tyr Leu Ile Asp Ile
        595                 600                 605

Asn Asp Asn Ala Pro Glu Leu Leu Pro Lys Glu Ala Gln Ile Cys Glu
    610                 615                 620
```

```
Arg Pro Asn Leu Asn Ala Ile Asn Ile Thr Ala Ala Asp Ala Asp Val
625                 630                 635                 640

His Pro Asn Ile Gly Pro Tyr Val Phe Glu Leu Pro Phe Val Pro Ala
                645                 650                 655

Ala Val Arg Lys Asn Trp Thr Ile Thr Arg Leu Asn Gly Asp Tyr Ala
            660                 665                 670

Gln Leu Ser Leu Arg Ile Leu Tyr Leu Glu Ala Gly Met Tyr Asp Val
        675                 680                 685

Pro Ile Ile Val Thr Asp Ser Gly Asn Pro Pro Leu Ser Asn Thr Ser
    690                 695                 700

Ile Ile Lys Val Lys Val Cys Pro Cys Asp Asp Asn Gly Asp Cys Thr
705                 710                 715                 720

Thr Ile Gly Ala Val Ala Ala Ala Gly Leu Gly Thr Gly Ala Ile Val
                725                 730                 735

Ala Ile Leu Ile Cys Ile Leu Ile Leu Leu Thr Met Val Leu Leu Phe
            740                 745                 750

Val Met Trp Met Lys Arg Arg Glu Lys Glu Arg His Thr Lys Gln Leu
        755                 760                 765

Leu Ile Asp Pro Glu Asp Asp Val Arg Glu Lys Ile Leu Lys Tyr Asp
    770                 775                 780

Glu Glu Gly Gly Gly Glu Glu Asp Gln Asp Tyr Asp Leu Ser Gln Leu
785                 790                 795                 800

Gln Gln Pro Glu Ala Met Gly His Val Pro Ser Lys Ala Pro Gly Val
                805                 810                 815

Arg Arg Val Asp Glu Arg Pro Val Gly Pro Glu Pro Gln Tyr Pro Ile
            820                 825                 830

Arg Pro Met Val Pro His Pro Gly Asp Ile Gly Asp Phe Ile Asn Glu
        835                 840                 845

Gly Leu Arg Ala Ala Asp Asn Asp Pro Thr Ala Pro Pro Tyr Asp Ser
    850                 855                 860

Leu Leu Val Phe Asp Tyr Glu Gly Ser Gly Ser Thr Ala Gly Ser Val
865                 870                 875                 880

Ser Ser Leu Asn Ser Ser Ser Ser Gly Asp Gln Asp Tyr Asp Tyr Leu
```

885 890 895

Asn Asp Trp Gly Pro Arg Phe Lys Lys Leu Ala Asp Met Tyr Gly Gly
900 905 910

Gly Glu Glu Asp
915

<210> 10

<211> 814

<212> PRT

<213> Homo sapiens

<400> 10

Met Asp Ala Ala Phe Leu Leu Val Leu Gly Leu Leu Ala Gln Ser Leu
1 5 10 15

Cys Leu Ser Leu Gly Val Pro Gly Trp Arg Arg Pro Thr Thr Leu Tyr
20 25 30

Pro Trp Arg Arg Ala Pro Ala Leu Ser Arg Val Arg Arg Ala Trp Val
35 40 45

Ile Pro Pro Ile Ser Val Ser Glu Asn His Lys Arg Leu Pro Tyr Pro
50 55 60

Leu Val Gln Ile Lys Ser Asp Lys Gln Gln Leu Gly Ser Val Ile Tyr
65 70 75 80

Ser Ile Gln Gly Pro Gly Val Asp Glu Glu Pro Arg Gly Val Phe Ser
85 90 95

Ile Asp Lys Phe Thr Gly Lys Val Phe Leu Asn Ala Met Leu Asp Arg
100 105 110

Glu Lys Thr Asp Arg Phe Arg Leu Arg Ala Phe Ala Leu Asp Leu Gly
115 120 125

Gly Ser Thr Leu Glu Asp Pro Thr Asp Leu Glu Ile Val Val Val Asp
130 135 140

Gln Asn Asp Asn Arg Pro Ala Phe Leu Gln Glu Ala Phe Thr Gly Arg
145 150 155 160

Val Leu Glu Gly Ala Val Pro Gly Thr Tyr Val Thr Arg Ala Glu Ala
165 170 175

```
Thr Asp Ala Asp Asp Pro Glu Thr Asp Asn Ala Ala Leu Arg Phe Ser
            180                 185                 190

Ile Leu Gln Gln Gly Ser Pro Glu Leu Phe Ser Ile Asp Glu Leu Thr
        195                 200                 205

Gly Glu Ile Arg Thr Val Gln Val Gly Leu Asp Arg Glu Val Val Ala
    210                 215                 220

Val Tyr Asn Leu Thr Leu Gln Val Ala Asp Met Ser Gly Asp Gly Leu
225                 230                 235                 240

Thr Ala Thr Ala Ser Ala Ile Ile Thr Leu Asp Asp Ile Asn Asp Asn
                245                 250                 255

Ala Pro Glu Phe Thr Arg Asp Glu Phe Phe Met Glu Ala Ile Glu Ala
            260                 265                 270

Val Ser Gly Val Asp Val Gly Arg Leu Glu Val Glu Asp Arg Asp Leu
        275                 280                 285

Pro Gly Ser Pro Asn Trp Val Ala Arg Phe Thr Ile Leu Glu Gly Asp
    290                 295                 300

Pro Asp Gly Gln Phe Thr Ile Arg Thr Asp Pro Lys Thr Asn Glu Gly
305                 310                 315                 320

Val Leu Ser Ile Val Lys Ala Leu Asp Tyr Glu Ser Cys Glu His Tyr
                325                 330                 335

Glu Leu Lys Val Ser Val Gln Asn Glu Ala Pro Leu Gln Ala Ala Ala
            340                 345                 350

Leu Arg Ala Glu Arg Gly Gln Ala Lys Val Arg Val His Val Gln Asp
        355                 360                 365

Thr Asn Glu Pro Pro Val Phe Gln Glu Asn Pro Leu Arg Thr Ser Leu
    370                 375                 380

Ala Glu Gly Ala Pro Pro Gly Thr Leu Val Ala Thr Phe Ser Ala Arg
385                 390                 395                 400

Asp Pro Asp Thr Glu Gln Leu Gln Arg Leu Ser Tyr Ser Lys Asp Tyr
                405                 410                 415

Asp Pro Glu Asp Trp Leu Gln Val Asp Ala Ala Thr Gly Arg Ile Gln
            420                 425                 430

Thr Gln His Val Leu Ser Pro Ala Ser Pro Phe Leu Lys Gly Gly Trp
        435                 440                 445
```

```
Tyr Arg Ala Ile Val Leu Ala Gln Asp Asp Ala Ser Gln Pro Arg Thr
    450                 455                 460

Ala Thr Gly Thr Leu Ser Ile Glu Ile Leu Glu Val Asn Asp His Ala
465                 470                 475                 480

Pro Val Leu Ala Pro Pro Pro Pro Gly Ser Leu Cys Ser Glu Pro His
                485                 490                 495

Gln Gly Pro Gly Leu Leu Leu Gly Ala Thr Asp Glu Asp Leu Pro Pro
            500                 505                 510

His Gly Ala Pro Phe His Phe Gln Leu Ser Pro Arg Leu Pro Glu Leu
        515                 520                 525

Gly Arg Asn Trp Ser Leu Ser Gln Val Asn Val Ser His Ala Arg Leu
    530                 535                 540

Arg Pro Arg His Gln Val Pro Glu Gly Leu His Arg Leu Ser Leu Leu
545                 550                 555                 560

Leu Arg Asp Ser Gly Gln Pro Pro Gln Gln Arg Glu Gln Pro Leu Asn
                565                 570                 575

Val Thr Val Cys Arg Cys Gly Lys Asp Gly Val Cys Leu Pro Gly Ala
            580                 585                 590

Ala Ala Leu Leu Ala Gly Gly Thr Gly Leu Ser Leu Gly Ala Leu Val
        595                 600                 605

Ile Val Leu Ala Ser Ala Leu Leu Leu Leu Val Leu Val Leu Leu Val
    610                 615                 620

Ala Leu Arg Ala Arg Phe Trp Lys Gln Ser Arg Gly Lys Gly Leu Leu
625                 630                 635                 640

His Gly Pro Gln Asp Asp Leu Arg Asp Asn Val Leu Asn Tyr Asp Glu
                645                 650                 655

Gln Gly Gly Gly Glu Glu Asp Gln Asp Ala Tyr Asp Ile Ser Gln Leu
            660                 665                 670

Arg His Pro Thr Ala Leu Ser Leu Pro Leu Gly Pro Pro Pro Leu Arg
        675                 680                 685

Arg Asp Ala Pro Gln Gly Arg Leu His Pro Gln Pro Pro Arg Val Leu
    690                 695                 700

Pro Thr Ser Pro Leu Asp Ile Ala Asp Phe Ile Asn Asp Gly Leu Glu
705                 710                 715                 720
```

Ala Ala Asp Ser Asp Pro Ser Val Pro Pro Tyr Asp Thr Ala Leu Ile
725 730 735

Tyr Asp Tyr Glu Gly Asp Gly Ser Val Ala Gly Thr Leu Ser Ser Ile
740 745 750

Leu Ser Ser Gln Gly Asp Glu Asp Gln Asp Tyr Asp Tyr Leu Arg Asp
755 760 765

Trp Gly Pro Arg Phe Ala Arg Leu Ala Asp Met Tyr Gly His Pro Cys
770 775 780

Gly Leu Glu Tyr Gly Ala Arg Trp Asp His Gln Ala Arg Glu Gly Leu
785 790 795 800

Ser Pro Gly Ala Leu Leu Pro Arg His Arg Gly Arg Thr Ala
805 810

<210> 11

<211> 3205

<212> DNA

<213> Homo sapiens

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